

REMARKS

We have amended the claims to address the Examiner's objections. We have also corrected other problems that we identified in the claims. For example, original claim 1 included the phrase "images the input beam onto a spot." Technically, an imaging system does not image a beam; rather it focuses the beam. So, we have amended the claim to make it more technically correct. More specifically, we amended that phrase to read "focuses the input beam onto a spot." We made a similar change to claim 20.

Also, we propose to rearrange the wording of claim 39 and to add a reference to the interference signal that is produced by focusing the interference beam onto the detector element. The rearrangement involved moving the reference to the two shifting steps into a new step which we have referred to "establishing measurement conditions." These changes have not broadened the scope of the claim so they do not raise any new issues of patentability.

We also propose to add claims 43-47, which depend either directly or indirectly from independent claim 39. The support for these dependent claims comes from the two paragraphs of specification starting on page 22, line 15 and ending on page 23, line 17. For the Examiner's convenience we have quoted those two paragraphs below and we have underlined the particularly relevant portions:

The sum of the forward scattered/reflected components and the backscattered components of return measurement beam components of beam components 26A and 26B are measured in the first or second embodiments by making a first non-joint or joint measurement, respectively, of the conjugated quadratures of fields of measurement beams scattered/reflected at the spots in or on substrate 60 as described. Next a $\pi/2$ phase shifter is introduced either at concave surface 42B or at concave surface 46B for either the right half or left half of the aperture of the imaging system 10 shown in Fig. 1c. An example of a $\pi/2$ phase shifter 46C is shown in Fig. 1e in the right half of the aperture of imaging system 10 at concave surface 46B. With $\pi/2$ phase shifter 46C in place, the forward scattered/reflected components and the backscattered components of return measurement beam components of beams 26A and 26B are next measured in the first or second embodiments, respectively, by making a second non-joint or joint measurement, respectively, of the conjugated quadratures of fields of measurement beams scattered/reflected at the spots in or on substrate 60.

The relative phase of the reference and return measurement beam components of beams 32A and 32B are the same in both of the first and second set of non-joint or joint measurements of the conjugated quadratures of fields of measurement beams scattered/reflected at the spots in or on substrate 60 for the forward scattered/reflected

components. However, as a consequence of the $\pi/2$ phase shift introduced by the $\pi/2$ phase shifter 46C, the relative phase of the backscattered components of return measurement beam components of beams 32A and 32B are different by π and as a result interferometrically cancel out in the second set of non-joint or joint measurements, respectively, of the conjugated quadratures of fields of measurement beams scattered/reflected at the spots in or on substrate 60. As a consequence of the effect of $\pi/2$ phase shifter 46C, only the forward scattered/reflected component of the fields scattered/reflected by the spots on or in substrate 60 is obtained from the second set of non-joint or joint measurements, respectively, of the conjugated quadratures of fields. Accordingly the backscattered component of the fields scattered/reflected by the spots on or in substrate 60 is obtained by subtracting the second set of non-joint or joint measurements, respectively, of the conjugated quadratures of fields from the first set of non-joint or joint measurements, respectively, of the conjugated quadratures of fields.

Original claim 39 relates to establishing measurement conditions by introducing phase shifter 46C. Claim 43 relates to measuring the interference signal when phase shifter 46C is in place in order to obtain a first set of data (i.e., first results). Claim 44 relates to establishing other measurement conditions by removing the phase shifter 46C. Claim 45 relates to measuring the interference signal when phase shifter 46C is removed in order to obtain a second set of data (i.e., second results). Claims 46 and 47 relate to using the first and second results to compute a backscattered component.

We ask the Examiner to enter the proposed dependent claims.

In view of the above, we believe the pending application is in condition for allowance and ask the Examiner to allow the claims.

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